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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,474	03/11/2005	Masashi Enomoto	S1459.7006GUS00	3592
23628 7590 06/08/2009 WOLF GREENFIELD & SACKS, P.C. 600 ATLANTIC AVENUE BOSTON, MA 02210-2206				
EXAMINER				
TRINH, THANH TRUC				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
06/08/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/527,474

Applicant(s)

ENOMOTO ET AL.

Examiner

THANH-TRUC TRINH

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 1-26 and 35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 27-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Remarks

1. Claims 1-35 are pending in the applications. Claims 1-26 and 35 are withdrawn.
2. All previous rejections of claims 27-34 are maintained.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 27-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lahav et al ("Assembly of a Zn(II)-Porphryn-Bipyridinium Dyad and Au-Nanoparticles Superstructures on Conductive Surfaces," J.Am.Chem.Soc., 1999).

Regarding claim 27, Lahav et al teaches an optical/electrical conversion element (page 258/column 1/paragraph 1) including an optical/electrical conversion layer formed by an assembly of a light-absorbing dendrimer structure (page 258/column 2/paragraph 2) operating as an electron donor and fine metal particles operating as an electron receptor (page 258/column 2/paragraph 2). With regard to the limitation of the optical/electrical conversion element being part of a solar battery, it would be obvious to one of ordinary skill in the pertinent art at the time of the invention to use the layers in Lahav et al within a solar battery. Lahav et al teaches that the function of these layers is for miniaturization of devices and electron transfer within those devices (page 258/column 1/paragraph 1) as well as having photosensitizing properties (page 258/column 2/paragraph 2). It would therefore be considered to be within the realm of one of ordinary skill to use the layers of Lahav et al within a solar battery as solar batteries require photosensitizers as electron transfer within the battery in order to function properly.

Regarding claim 28, Lahav et al teaches all of the limitations as stated above. Lahav et al also teaches the optical/electrical conversion element wherein said

dendrimer structure of the optical/electrical conversion element is bound to said fine metal particles on a surface (page 258/column 2/paragraph 3).

Regarding claim 29, Lahav et al teaches all of the limitations as stated above. With regard to the limitation of said dendrimer structure of the optical/electrical conversion element includes a disulfide group taking part in bonding on a surface thereof, the lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith." In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

Regarding claim 30, Lahav et al teaches all of the limitations as stated above. Lahav et al also teaches the optical/electrical conversion element wherein said dendrimer structure of the optical/electrical conversion element includes molecules or groups of atoms exhibiting light absorption properties (page 259/column 1/paragraph 1).

Regarding claim 31, Lahav et al teaches all of the limitations as stated above. Lahav et al also teaches the solar battery wherein said molecules or groups of atoms

exhibiting light absorption properties in the optical/electrical conversion element comprise a porphyrin structure or a phthalocyanine structure (page 259/column 1/paragraph 1).

Regarding claim 32, Lahav et al teaches all of the limitations as stated above. Lahav et al also teaches the solar battery wherein said fine metal particles of the optical/electrical conversion element are of a nano-order particle size (page 258/column 2/paragraph 2).

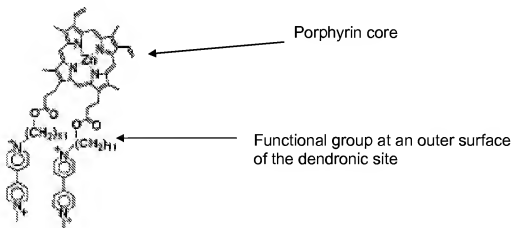
Regarding claim 33, Lahav et al teaches all of the limitations as stated above. Lahav et al also teaches the solar battery wherein said fine metal particles of the optical/electrical conversion element consists of gold (page 258/column 2/paragraph 2).

Regarding claim 34, Lahav et al teaches all of the limitations as stated above. With regard to the limitation of said optical/electrical conversion layer and an electrolyte layer of the optical/electrical conversion element are layered between a pair of electrode layers, it would be obvious to one of ordinary skill in the pertinent art at the time of the invention to use this particular structure within a solar battery. One of ordinary skill in the art would recognize this as a common structure for solar batteries and would use this structure in combination with the layers as described in Lahav et al.

Response to Arguments

Applicant's arguments filed 2/27/2009 have been fully considered but they are not persuasive.

Applicant argues that Lahav fails to disclose a dendrimer comprising a core, interior branches and terminal branches as seen in Figure 3 of Applicant's Specification. However, the Examiner respectfully disagrees. First of all, Applicant's claimed limitations do not limit to Figure 3 of Applicant's specification. Secondly, there is no such definition found in Applicant's specification that a dendrimer has to comprise a core, interior branches and terminal branches. On the contrary, Applicant's specification defines a dendrimer porphyrin structure having a porphyrin core (center portion) and including and an ionic functional group on an outer surface of the dendronic site (See Applicant's page, paragraph 4). Lahav discloses a Zn(II)-porphyrin-Bipyridinium Dyad having a molecular formula as seen below, which comprises a porphyrin core and ionic functional group on an outer surface of the dendronic site (see the indications).



Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THANH-TRUC TRINH whose telephone number is (571)272-6594. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

TT
6/3/2009